JOANNA COLE & BRUCE DEGEN

The Magic School Bus

Inside the Earth

SCHOLASTIC

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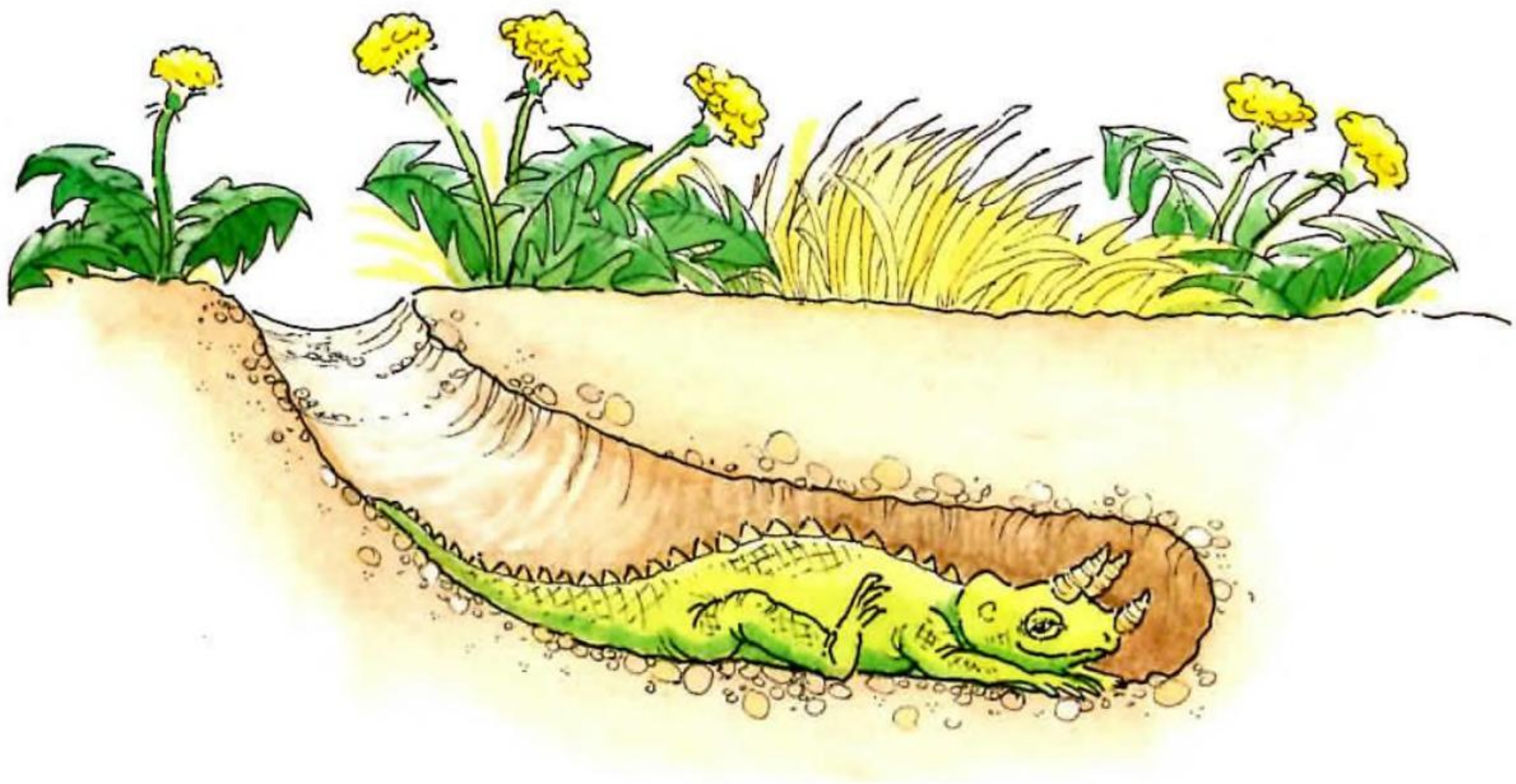
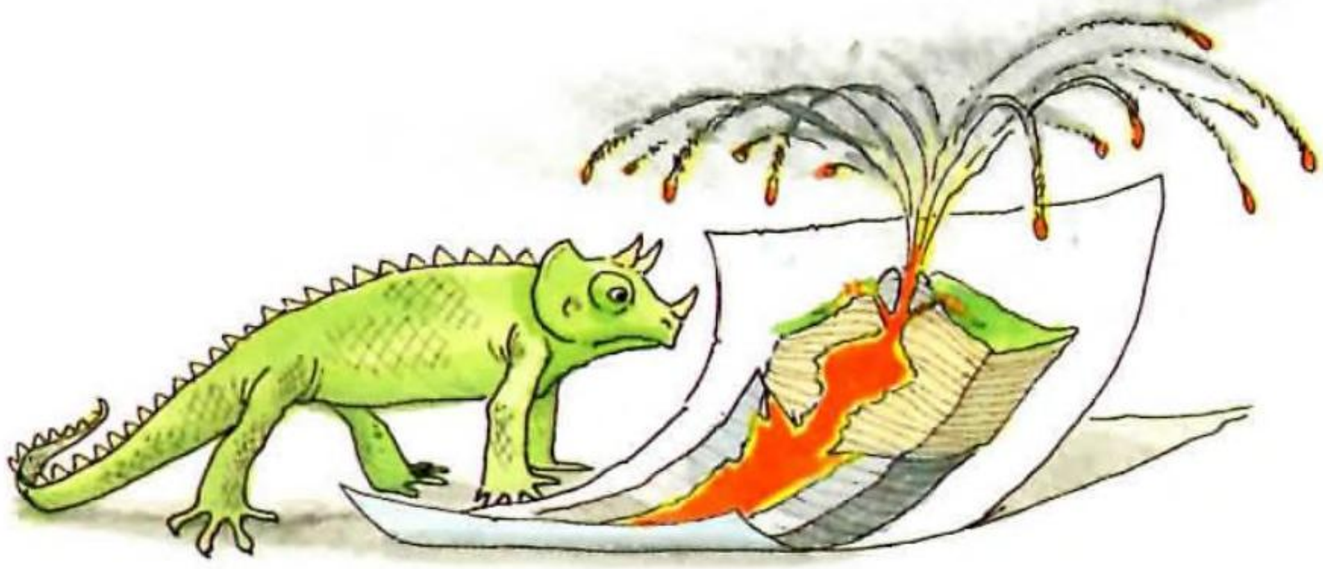


The Magic School Bus

Inside the Earth

By Joanna Cole

Illustrated by Bruce Degen



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IT'S YOUR TURN TO BE THE ANT MONITOR, ARNOLD

PAPER WASP NEST

THE ANT MONITOR?!

IS IT ALWAYS LIKE THIS IN MS. FRIZZLE'S CLASS?

YOU'LL GET USED TO IT.

BEEHIVE

Ant Farm

Ant Food

MOUSE HOLE

OWL'S Nest

NEW KID

In Ms. Frizzle's class,
we had been learning about
animals' homes
for almost a month.
We were pretty tired of it.
So everyone was happy
when Ms. Frizzle announced,
"Today we start something new."

"We are going to study
about our earth!" said Ms. Frizzle.
She put us to work
writing reports
about earth science.
"And for homework,"
she said,
"each person must find a rock
and bring it to school."

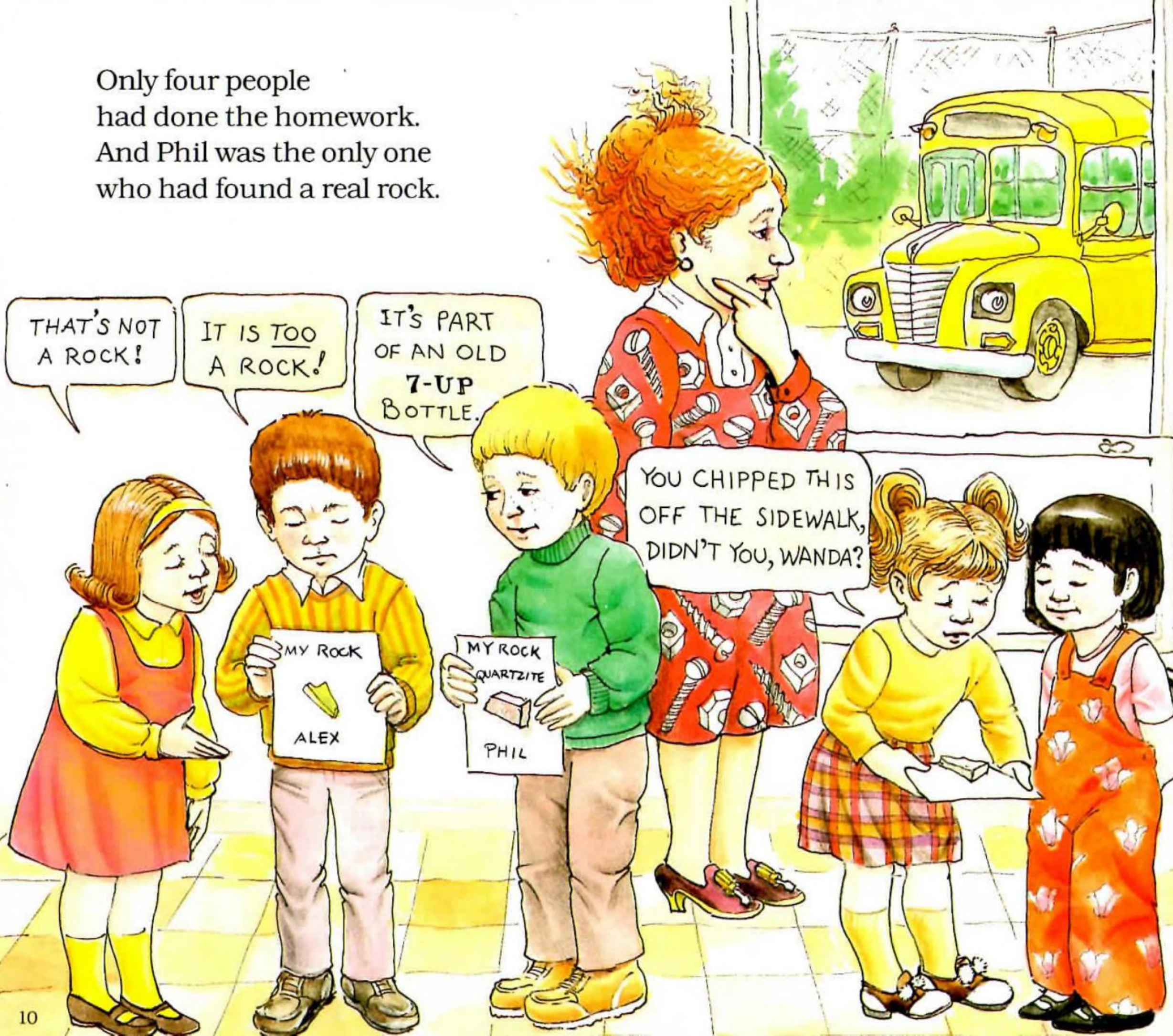
But the next day,
almost everyone had
some excuse.

WHERE DO ROCKS COME FROM?
by Wanda

Most of the solid part of the earth is made of great masses of rock.

The small rocks that we collect are just pieces that broke off from these huge masses.

Only four people
had done the homework.
And Phil was the only one
who had found a real rock.

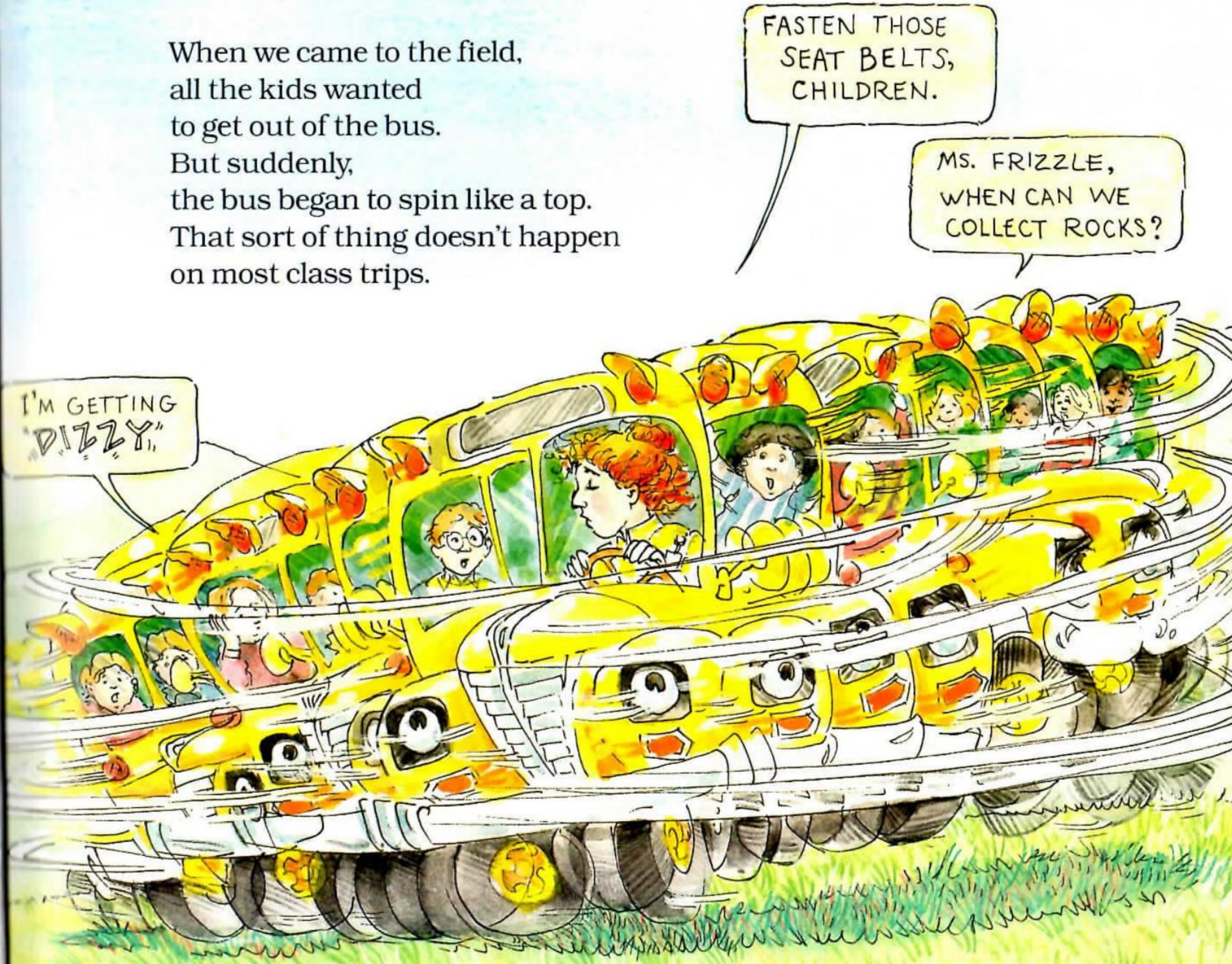


"I guess we'll have to
go on a field trip
and collect rocks,"
said Ms. Frizzle.

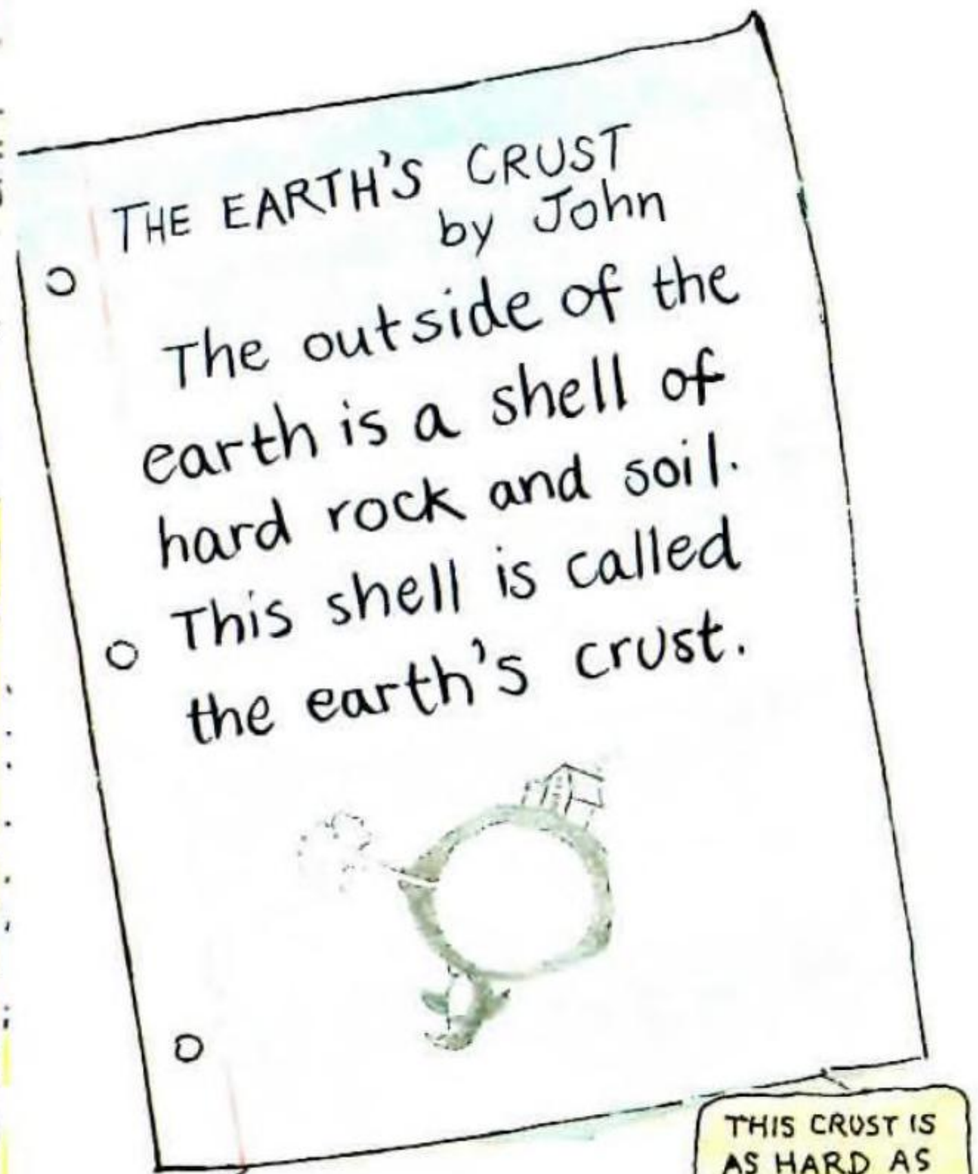
ARNOLD, THAT LOOKS LIKE STYROFOAM TO ME.
IT COULD BE A STALE CUPCAKE.
YEAH, COVERED WITH DIRT.
YOU ACTUALLY TOUCHED THIS, ARNOLD?
MY ROCK
ARNOLD
WHAT ARE ROCKS MADE OF?
by Tim
Rocks are made of minerals. Sometimes you see tiny specks of different colors in a rock. Sometimes you see shiny specks.
These different specks are the different minerals that make up the rock.

You never know
what will happen
on a trip with Ms. Frizzle.
Her new dress
was a trip in itself.
At first the old school bus
wouldn't start.
But finally we were on our way.

When we came to the field,
all the kids wanted
to get out of the bus.
But suddenly,
the bus began to spin like a top.
That sort of thing doesn't happen
on most class trips.



When the spinning finally stopped,
some things had changed.
We all had on new clothes.
The bus had turned into
a steam shovel.
And there were shovels and picks
for every kid in the class.
"Start digging!"
yelled Ms. Frizzle.
And we began making a huge hole
right in the middle of the field.



FIRST, WE WILL DIG THROUGH THE EARTH'S CRUST. THE TOP LAYER OF THE CRUST IS SOIL.

IT LOOKS LIKE DIRT TO ME.

DIRT IS ANOTHER WORD FOR SOIL.

OH, GREAT! NOW SHE CAN READ MY MIND!

WHAT IS SOIL?

by Florrie

Soil is made of ground-up rock, mixed with clay, bits of dead leaves, sticks, and small pebbles.

Without rock there would be no soil for plants and trees to grow in.

THERE IS ALWAYS ROCK UNDER YOU
by Shirley

Most of the rock in the earth's crust is covered with soil or water. But if you dig deep enough, you will find the rock.

Wherever you are standing or walking or floating on earth... there is rock under you.

Before long—CLUNK!—we hit rock. The Friz handed out jackhammers. We began to break through the hard rock.

"Hey, these rocks have stripes,"
said a kid.
Ms. Frizzle explained that
each stripe was a different
kind of rock.

HOW ROCK LAYERS WERE FORMED
by Molly

Millions of years ago, wind blew dust and sand into lakes and oceans. The dust and sand settled to the bottom in layers called sediment. Seashells formed layers of sediment, too.

Over time, the layers hardened into the sedimentary rock we see today.

AN EARTH SCIENCE WORD
by Dorothy Ann

Sedimentary comes from a word that means "to settle."

We chipped off pieces of the rocks for our class rock collection.
"These rocks are called *sedimentary* rocks, class," said Ms. Frizzle.
"There are often fossils in sedimentary rocks."

SANDSTONE IS MADE OF GRAINS OF SAND ALL PRESSED TOGETHER.
SHALE IS MADE OF MUD AND CLAY ALL PRESSED TOGETHER.
SANDSTONE FEELS GRAINY.
THIS SHALE HAS A FOSSIL OF A LEAF IN IT.

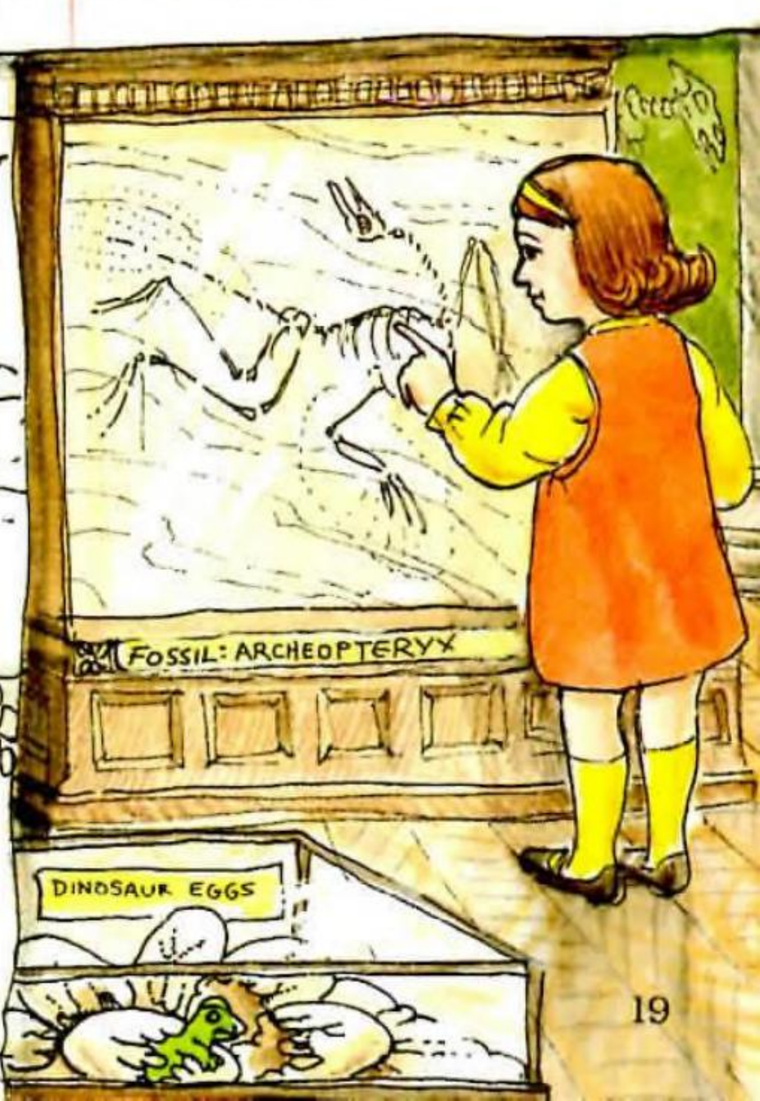
THIS LIMESTONE HAS A FOSSIL OF A SEASHELL IN IT.

THAT'S BECAUSE LIMESTONE IS MADE OF SHELLS ALL PRESSED TOGETHER.

MILLIONS OF YEARS AGO, THERE WAS A SEA HERE.

WHY THERE ARE FOSSILS IN ROCK LAYERS
by Phoebe

Sometimes a prehistoric plant or animal died and was buried in layers of mud, sand, or crushed shells. Then it turned to rock along with the layers. It became a fossil.



Wouldn't you know it?
Just when we were finding
lots of fossils,
Ms. Frizzle said,
"Back on the bus, kids."
Then, as we were driving along,
we heard rock crumbling underneath us.
Down we went.
Everything was pitch black.
And we were falling, falling, falling!

I'LL NEVER GET USED TO THIS.

CLASS, WE'RE NOW GOING DEEPER INTO THE EARTH.

I'D RATHER BE GOING BACK TO SCHOOL. (I CAN'T BELIEVE I SAID THAT!)

WE'RE FALLING!

HELP!

WAA-AA

We landed with a bump.
Ms. Frizzle switched on the headlights.
We had fallen through a hole
into a huge limestone cave.
"Rain water has been dripping down
through the earth for ages,"
said Ms. Frizzle.
"The water wore away this cave
in the rock."

THIS WHOLE CAVE IS MADE OF LIMESTONE. CAN YOU FIND MORE FOSSILS HERE?
HERE'S ONE, MS. FRIZZLE.
KNOCK IT OFF!
THE EMPIRE STATE BUILDING IS MADE OF LIMESTONE, TOO.

We wanted to stay for a while,
but suddenly, the bus sprouted a drill.
It started boring through the rock.
Frizzie shouted, "Follow that bus!"
And down we went.

LOOK! A STALAGMITE GROWING FROM THE GROUND...

AND A STALACTITE HANGING FROM THE CEILING!

How STALAGMITES AND STALACTITES ARE FORMED
by Phil

Shapes that look like cones and icicles are formed in caves by dripping water that contains tiny invisible bits of limestone.

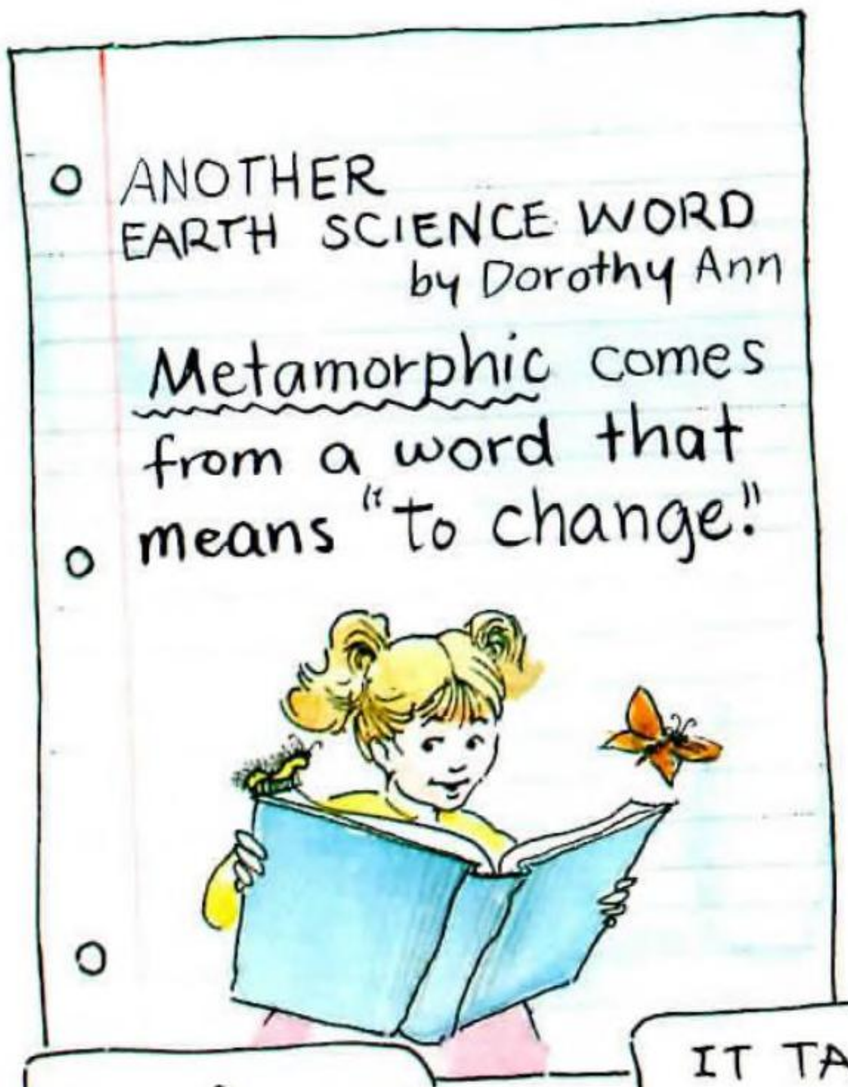
HOW TO REMEMBER WHICH IS WHICH:

The word stalagmite has a 'g' for ground.
The word stalactite has a 'c' for ceiling.

C

G

The farther down we went,
the hotter it got.
The rocks were harder, too.
"These are rocks that were changed
from one kind to another kind
by heat and pressure,"
explained The Friz.
"Rocks that were changed
are called *metamorphic* rocks."



I DIDN'T KNOW ROCKS COULD CHANGE.
IT TAKES MILLIONS OF YEARS.
THIS BEAUTIFUL MARBLE USED TO BE LIMESTONE.
THEY MAKE STATUES OUT OF MARBLE.
Ooo
MS Frizzle
TEACHER OF THE YEAR

LIMESTONE + HEAT + PRESSURE + TIME = MARBLE

THIS ROCK USED TO BE SHALE. IT WAS CHANGED TO SLATE.

SLATE IS HARDER THAN SHALE.

THIS ROCK IS VERY HARD.

KNOCK KNOCK

CUT IT OUT!

HOW IGNEOUS ROCKS WERE FORMED
by Michael

Melted rock can push up through cracks in the earth's crust. When the melted rock cools and hardens, it is called igneous rock.

STILL ANOTHER EARTH SCIENCE WORD
by Dorothy Ann

Igneous comes from a word that means "fire." The heat inside the earth is like fire. It can melt rocks.

We went down even farther toward the center of the earth.
We hit rock that was formed billions of years ago from a pool of melted rock under the earth's surface.
Rock like this is called *igneous* rock.

THIS IGNEOUS ROCK IS CALLED GRANITE. MANY BUILDINGS AND MONUMENTS ARE MADE OF GRANITE.

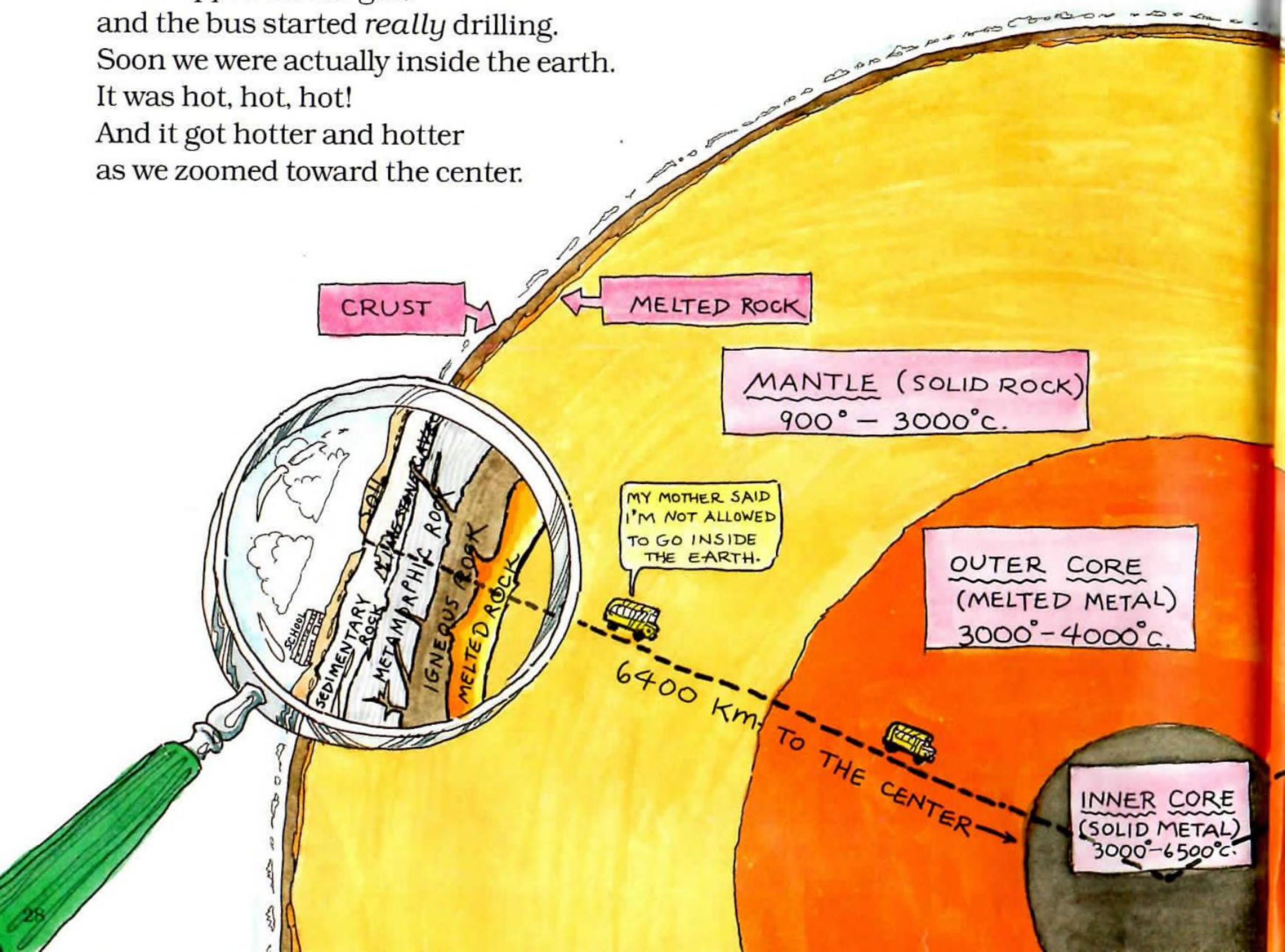
ARNOLD, WILL YOU CARRY THESE SAMPLES?

EARTH SCIENCE IS HEAVY, MAN.

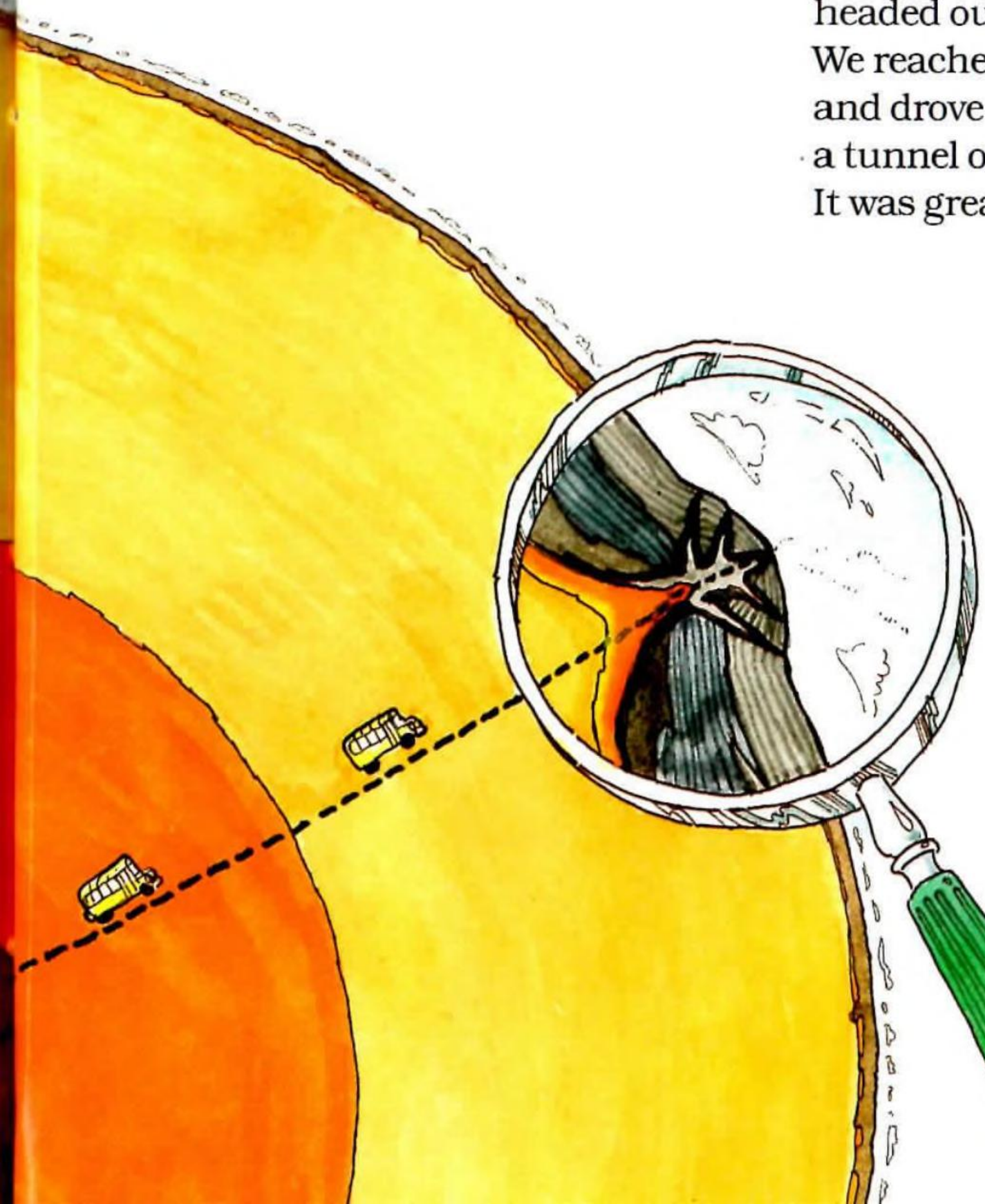
I NEVER KNEW ROCKS COULD MELT!

We had dug all the way
through the earth's crust.
It was so hot now
that Ms. Frizzle told us to
get back in the bus.

She stepped on the gas,
and the bus started *really* drilling.
Soon we were actually inside the earth.
It was hot, hot, hot!
And it got hotter and hotter
as we zoomed toward the center.



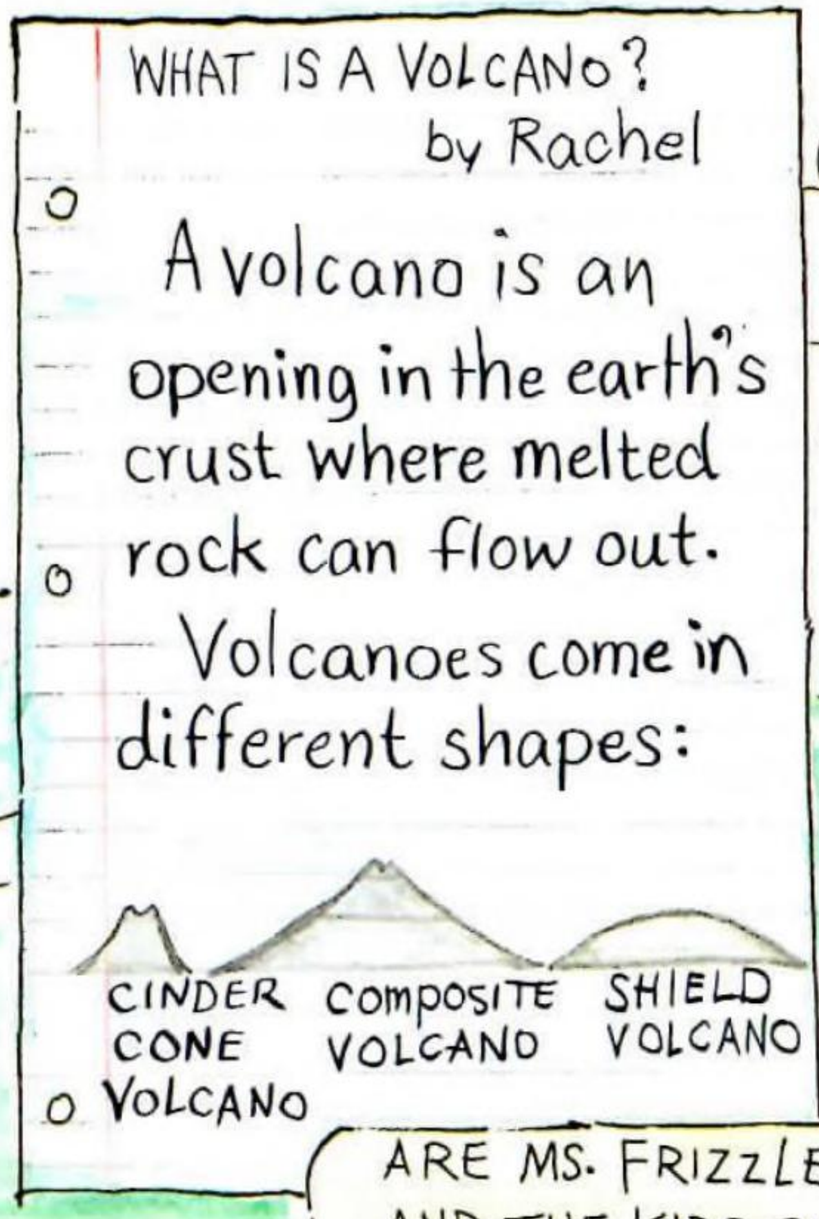
We were glad when Ms. Frizzle
headed out again.
We reached the earth's crust
and drove straight up through
a tunnel of black rock.
It was great to see the sky.



WHAT IS INSIDE THE EARTH
by Ralph

Under the earth's crust there are pockets of melted rock. Below this is the mantle, made of solid hot rock.

The outer core is liquid metal and the very center of the earth, the inner core, is a ball of solid metal.


WHAT IS A VOLCANO?
by Rachel
A volcano is an opening in the earth's crust where melted rock can flow out.
Volcanoes come in different shapes:
CINDER CONE VOLCANO
COMPOSITE VOLCANO
SHIELD VOLCANO

Then we looked around.
We had come out on an island
in the middle of the ocean!
"Isn't this wonderful, class?"
said Frizzie.
"We've driven right up
on a volcanic island!"
It didn't look like much.
But if Ms. Frizzle was right,
the whole island was one big volcano!

We were nervous, but Ms. Frizzle made us
collect some rocks.
She said they had all
hardened from melted rock that had come
out of the volcano.
Then, suddenly, we heard rumblings from below.

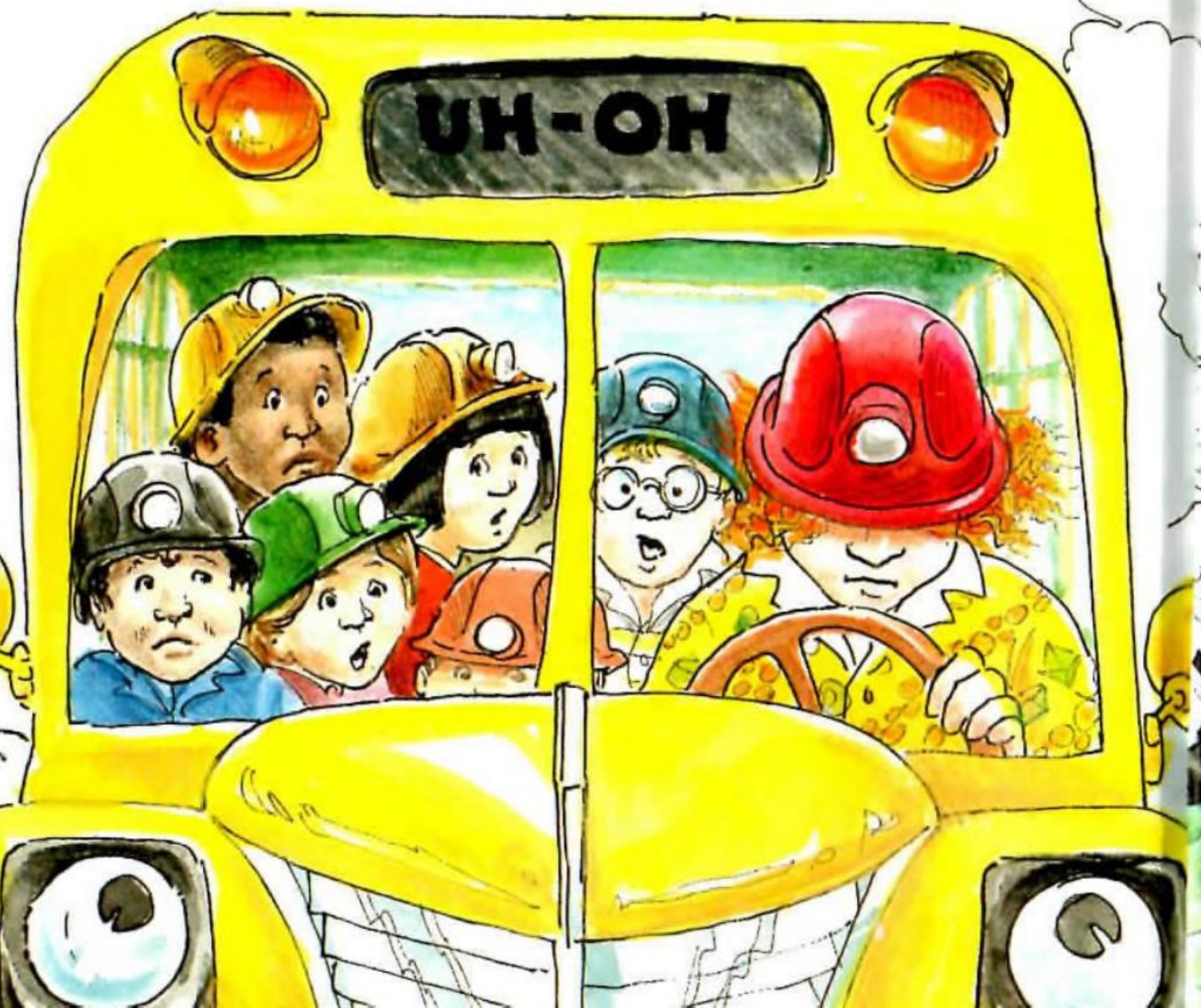
THE BLACK ROCK WE'RE WALKING ON IS BASALT.
THIS SHINY VOLCANIC GLASS IS OBSIDIAN.
HEY! THIS ROCK FLOATS!
THAT'S PUMICE. AIR BUBBLES INSIDE MAKE IT THE LIGHTEST ROCK THERE IS.
I HEAR RUMBLING!
IS THAT YOUR STOMACH, ARNOLD?

VOLCANOES MAKE NEW LAND by Arnold

The material that comes out of a volcano is melted rock called lava. When lava cools, it hardens into new rock. In time, soil forms on the rock and plants can grow.

I DIDN'T KNOW VOLCANOES COULD BE USEFUL!

We scrambled into the bus.
The Friz turned the ignition key
and stepped on the gas.
Nothing happened.
The bus would not start!
We thought we were goners!



Red-hot lava came streaming
out of the volcano.
Some of it shot into the air
like a fountain.
Some of it flowed over the land
like a river.
Our bus went along with it –
right into the sea.

CLASS, WHEN THIS LAVA HARDENS, IT WILL BE THE NEWEST ROCK ON EARTH.

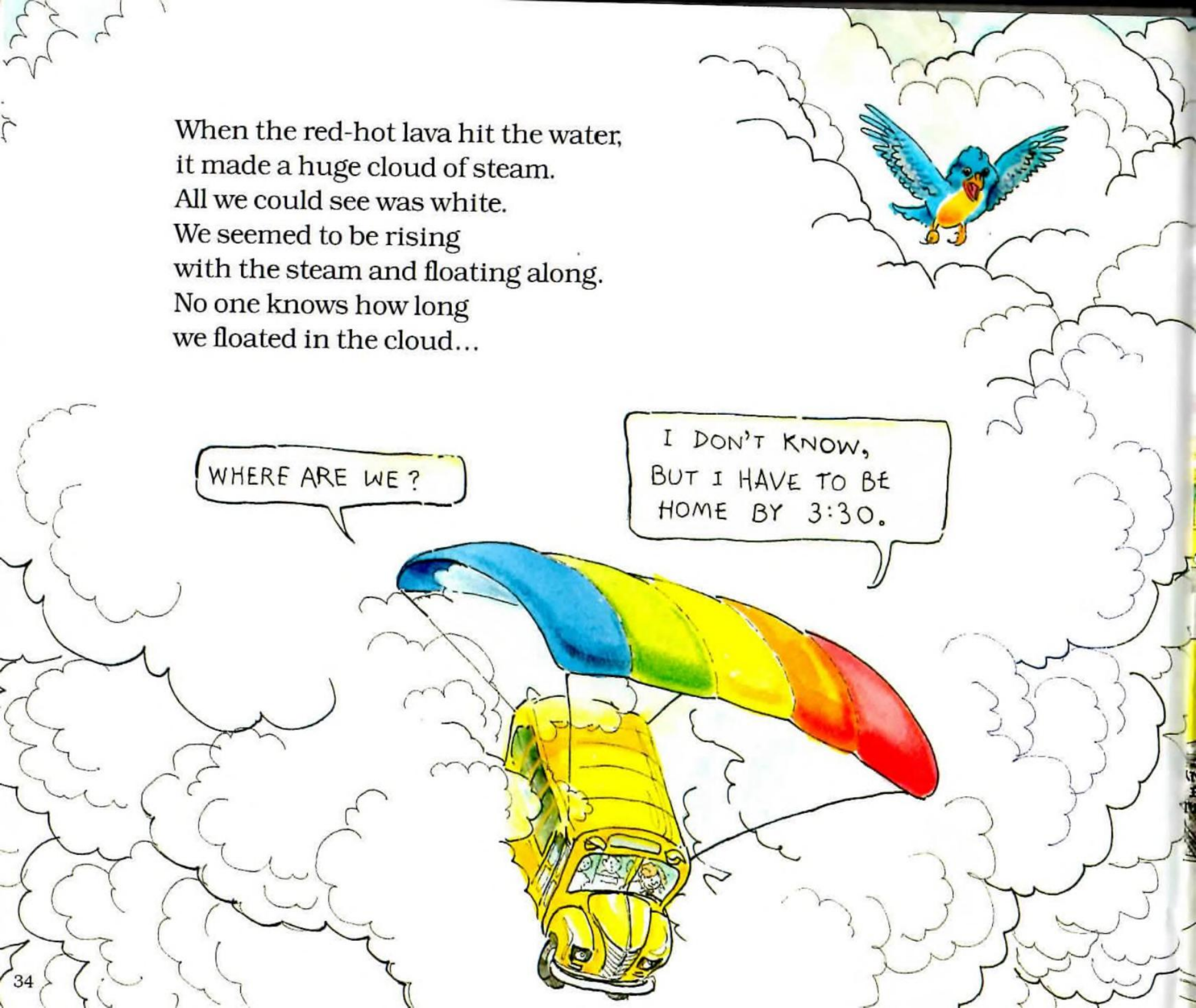
WHO CARES? JUST GET US OUT OF HERE!

HISSSS

HISSSS

HISSSSSSS

When the red-hot lava hit the water,
it made a huge cloud of steam.
All we could see was white.
We seemed to be rising
with the steam and floating along.
No one knows how long
we floated in the cloud...



but when it finally cleared,
we were back in the school parking lot.

DID WE REALLY GO INSIDE THE EARTH IN THAT BEAT-UP OLD BUS?

WHO KNOWS?

SANDSTONE

LIMESTONE (FOR THE LAWN)

MARBLE

GRANITE

SLATE

LIMESTONE AND SHALE

CEMENT

It had been a weird trip,
but we *did* get
a great rock collection
for our classroom.

Rock Collection

by Ms. Frizzle's Class

HEY! I'M NOT A ROCK!

Shirley's rock
LIMESTONE

TYPE: Sedimentary (formed from shells)
USES: Buildings, chalk, cement, fertilizer

Amanda Jane's rock
MARBLE

TYPE: Metamorphic (formed from limestone)
USES: Statues, monuments, buildings

Phoebe's rock
SHALE

TYPE: Sedimentary (formed by mud)
USES: Ground up and mixed with limestone for cement, brick

Wanda's rock
GRANITE

TYPE: Igneous
USES: Monuments, buildings, Curbstones

John's rock
SLATE

TYPE: Metamorphic (formed from shale)
USES: Roofing tile, flagstones, chalkboards

Michael's rock
SANDSTONE

TYPE: Sedimentary (formed by sand)
USES: Buildings, grindstones

Molly's rock
BASALT

TYPE: Igneous (volcanic)
USES: Road Building

Rachel's rock
OBSIDIAN

TYPE: Igneous (volcanic)
USES: Decoration, Indian Arrowheads

Florrie's rock
PUMICE

TYPE: Igneous (volcanic)
USES: Ground-up in scouring powder

Phil's rock
QUARTZITE

TYPE: Metamorphic (formed from sandstone)
USES: Millstones for grinding grain, road building

A WORD WITH THE AUTHOR AND THE ARTIST

The first reader of this book called to complain. He said the book was full of mistakes. We recorded the conversation to help you decide which things are true and which were put in to make the story more exciting.

READER: This book is full of mistakes!

AUTHOR: It is not!

ARTIST: Everything in this book is absolutely true and really happened.

READER: What about the beaver lodge on page 7?

AUTHOR: Oh, that. Well, I guess that *would* be too messy in a real classroom.

READER: And the beehive?

ARTIST: That, too. But everything else is fact.

READER: Oh, come *on!* You mean kids can use jackhammers (page 16), and a bus can change into a steam shovel (page 14) and a drill (page 23)?

AUTHOR: Well, er, now that you mention it, that is not really possible.

READER: And do you expect me to believe that a bus can go through the center of the earth (page 28)?

ARTIST: Yes....

AUTHOR: Maybe....

ARTIST: Well, actually, no. The bus couldn't do that, either.

AUTHOR: Even if a bus *could* drill its way through, the distance is so long that the trip would take months, even years.

READER: And what about the heat?

AUTHOR: Okay, okay! It's white-hot in the center of the earth. The bus would be burned up in a minute.

READER: Isn't it kind of ridiculous to say that air-conditioning would help?

AUTHOR: Gee, you're a tough cookie! Okay, you're right. Air-conditioning could not make any difference in that kind of heat.

READER: And the bus could not flow in lava and go up in a cloud of steam (pages 33-34)?

ARTIST: Give us a break! You're right again. That's not true, either.

READER: But you said *everything* was true!

AUTHOR: Everything *else* is. Honest!

READER: Everything else is true? There truly are sedimentary, metamorphic, and igneous rocks?

AUTHOR: Certainly!

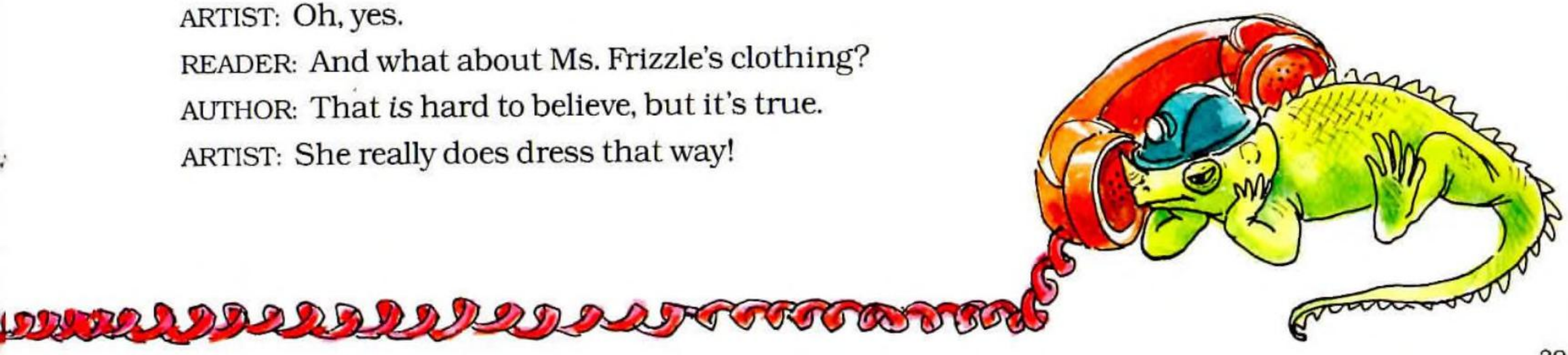
READER: And lava really does harden into new rock?

ARTIST: Oh, yes.

READER: And what about Ms. Frizzle's clothing?

AUTHOR: That *is* hard to believe, but it's true.

ARTIST: She really does dress that way!



HOW TO SAY OUR NEW EARTH SCIENCE WORDS

basalt
(buh·SAWLT)

granite
(GRAN·it)

igneous
(IHG·nee·uhs)

lava
(LAH·vuh)

metamorphic
(met·uh·MAWR·fik)

obsidian
(ahb·SIHD·ee·un)

pumice
(PUHM·ihs)

quartzite
(KWAWRT·site)

sedimentary
(sed·uh·MEN·tar·ee)

stalactite
(stuh·LAK·tite)

stalagmite
(stuh·LAG·mite)

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